3. The coupler/modulator according to claim 2 wherein said converging and diverging radiation paths are solid state optical channels.

4. The coupler/modulator according to claim 1 wherein said converging and diverging radiation paths are solid state waveguides.

5. The coupler according to claim 2 wherein said radiation is emitted by a laser and said laser is integral with said coupler/modulator input end.

6. The coupler/modulator according to claim 1 further comprising two substantially parallel channels between said first and second diverging and said third and fourth converging channels respectively.

7. The coupler/modulator according to claim 6 further comprising a phase shifting element in each of said two parallel channels and a third one in between the channels and wherein said phase shifting elements are connected to said analog modulator driver in a push pull configuration.

8. A method for simultaneously modulating and coupling a radiation beam to a receptor input end, said input end comprising an input mode, the method comprising:

a. splitting said radiation beam into a first and a second substantially equal intensity beams propagating along first and second solid state equidistant diverging channels;

b. directing said split diverging beams to and along a third and a fourth also solid state equidistant converging radiation propagation channels respectively, said channels converging at an angle 2θ relative to each other, wherein said third and fourth channels terminate at an end point prior to overlapping;

c. forming an interference pattern of said converging third and fourth beams in an interference zone after exiting said third and fourth channels said pattern comprising at least one constructive interference fringe having an optical field amplitude and a spatial mode;

d. positioning said radiation receptor input end in said interference zone at a point where said constructive interference fringe mode matches said first receptor input mode; and

e. altering the optical field amplitude incident on said receptor input end by applying an analog modulating signal to shift the phase of said at least one of said beams and laterally shifting the position of said constructive interference fringe across said input end of said receptor.

ABSTRACT

A device for simultaneously coupling and modulating incident radiation to a single mode optical fiber based on a solid state truncated integrated Mach-Zehnder interferometer having a back end formed by two converging radiation channels converging at an angle θ and terminating prior to overlapping. The angle θ is calculated to produce in an interference zone formed by the exiting radiation a primary constructive interference fringe that provides an optimum match to an input fiber mode of a fiber positioned within the interference zone. Phase shifting elements in the radiation propagation paths provide a linear shift of the constructive interference fringe across the input of the fiber optic in response to an analog signal.